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| 10/586,452 | 07/18/2006 | Tim Jungkamp | 12810-00323-US1 | 4478 |
| 30678 7590 11/25/2009 CONNOLLY BOVE LODGE & HUTZ LLP 1875 EYE STREET, N.W. SUITE 1100 WASHINGTON, DC 20006 | | | | |
| EXAMINER | | | | |
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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/586,452
Filing Date: July 18, 2006
Appellant(s): JUNGKAMP ET AL.

Bryant L. Young
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed August 25, 2009 appealing from the Office action mailed March 30, 2009.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

| | | |
|-------------------------------|-----------------|---------|
| WO 02/26698 | JUNGKAMP et al. | 04-2002 |
| US PGPUB 2004/0039221 | JUNGKAMP et al. | 02-2004 |
| English Equiv. of WO 02/26698 | | |

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jungkamp et al. (WO 02/26698).

The claims are drawn to a process for separating mixtures of isomeric pentenenitriles, in which at least one isomer is depleted from the mixture, i.e. separation of pentenenitriles, by distillation. Dependent claims detail which isomers are separated and that the mixture comes from different reactions.

Jungkamp et al. teach the azeotropic distillation of various pentenenitrile isomers. See page 2, line 39 through page 3, line 6 and Table 1, page 7.

Jungkamp et al. do not teach the exact pairs of isomers that are listed in claim 1 nor does Jungkamp et al. teach the exact reactions that the mixtures come from.

It would be obvious to one of ordinary skill to take the method proven by Jungkamp et al. and apply it to other mixtures of pentenenitrile isomers as distillation techniques such as fractional distillation, vacuum distillation, and azeotropic distillation are well known in the art and are readily applied by the person of ordinary skill in purifying isomeric liquids from one another. As to the reaction that the mixtures come from, one of skill in the art would be able to complete the distillation irrespective for which reaction the mixture of pentenenitriles originated from.

Therefore the claims are *prima facie* obvious over the prior art.

(10) Response to Argument

The Appellant argues that Jungkamp et al. does not describe or suggest a process for separating mixtures of isomeric pentenenitriles, in which at least one isomer is depleted from the mixture, as recited in the present claim 1.

Specifically, the Appellant argues that the person of ordinary skill in the art would not be motivated by Jungkamp et al. to separate the specific mixtures of isomers that

are within claim 1 by distilling under a pressure of from either 0.01 to 0.5 bar or from 0.02 to 0.5 bar. The Appellant also argues that the instantly claimed process has a higher degree of efficiency at lower pressures which is not described in the prior art.

The Examiner believes that Jungkamp et al. adequately suggests and motivates the person of ordinary skill in the art to apply the method of distillation in a vacuum for the specific pairs of pentenenitrile isomers in claim 1 and the dependent claims.

Firstly, while Jungkamp et al. do not teach a distillation example with the exact pairs of pentenenitrile isomers as in claim 1 and the dependent claims, Jungkamp et al. appreciates that the claimed isomers would be in a reaction mixture generated from the direct hydrocyanation of 1,3-butadiene with hydrogen cyanide. See paragraphs 7 and 8 on page 1 of the English equivalent, US PGPUB 2004/0039221.

Jungkamp et al. teaches that by azeotropic distillation, groups of pentenenitrile isomers can be separated because their relative volatility ratio (α) will be higher than without the addition of water. See paragraph 1 on page 1 of the English equivalent, US PGPUB 2004/0039221. The implication is that the addition of water, or another diluent to form an azeotrope, is not specifically necessary if the relative volatility ratio (α) is higher than 1.3. In the instant claims, as shown on page 1 of the instant specification, two pairs of isomers have a relative volatility higher than 1.3, and two pairs of isomers have a relative volatility lower than 1.3:

| Pentenenitrile isomer pair | Relative volatility at atmospheric pressure |
|---|---|
| 2-Methyl-3-butenenitrile / trans-3-pentenenitrile | 1.72 |
| cis-2-Pentenenitrile / trans-3-pentenenitrile | 1.55 |
| (E)-2-Methyl-2-butenenitrile / trans-3-pentenenitrile | 1.19 |
| 2-Methyl-3-butenenitrile / (Z)-2-methyl-2-butenenitrile | 1.12 |

Therefore, from looking at the teachings from Jungkamp et al. shown above, Jungkamp et al. would suggest that azeotropic distillation would be effective at separating the bottom two pairs of isomers in the table, while the top two pairs of isomers in the table would not necessarily require a diluent as there is a sufficient gap in the volatilities of the isomers. Additionally, the claims do not exclude the addition of water to the mixtures as the mixtures are described in open language by virtue of the term "comprising." Therefore, additional components, such as water, can be present.

The Appellant argues that Jungkamp et al. teaches that the distillation is carried out in the presence of a liquid diluent which forms with the pentenenitrile isomers, under the same pressure conditions. The Examiner agrees with this point that the azeotrope can be formed anywhere from 1 to 500 kPa. However, the Appellant does not argue why this point would support a conclusion for non-obviousness of the instant claims.

Jungkamp et al. additionally clearly suggest that the distillation can be accomplished under reduced pressure. While the most preferred way of distillation described in Jungkamp et al. is at atmospheric pressure, Jungkamp et al. teaches that the distillation can be carried out advantageously at a pressure ranging from 1 to 200 kPa. See paragraph 29 of page 2 of the English equivalent, US PGPU 2004/0039221.

As 1 bar is equal to 100 kPa, the range taught by Jungkamp et al. clearly contains the instantly claimed range of pressures.

Even though the Appellant has shown in the instant specification that distillation efficiency is increased at lower pressures, the Examiner believes that the suggestion by Jungkamp et al. that the distillation may be done at lower pressures and the overall *prima facie* case for obviousness is stronger than the evidence of increased efficiency since any vacuum distillation apparatus may be used in the instantly claimed process.

Therefore, the Examiner has considered the Appellant's arguments fully, but has not found them to be persuasive. The Examiner requests that the pending 35 U.S.C. 103(a) rejection be maintained.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Joseph R Kosack/

Examiner, Art Unit 1626

Conferees:

/REI-TSANG SHIAO /
Primary Examiner, Art Unit 1628

/James O. Wilson/
Supervisory Patent Examiner, Art Unit 1624